

CLAIMS

[1] A semiconductor device, comprising:

a semiconductor base comprising a first semiconductor region having a first conductivity type, a second semiconductor region having a second conductivity type
5 formed in a surface region of said first semiconductor region, and a third semiconductor region having the first conductivity type formed in a surface region of said second semiconductor region; and

a first electrode formed on said second semiconductor region sandwiched between said first semiconductor region and said third semiconductor region,

10 wherein: a first region, in which said third semiconductor region occupies said second semiconductor region at a first rate, is formed at a center of said semiconductor base, and

a second region, in which said third semiconductor region occupies said second semiconductor region at a second rate larger than said first rate, is formed at a
15 circumference of said semiconductor base so as to enclose said first region.

[2] The semiconductor device according to claim 1,

wherein there are a plurality of said third semiconductor region, which are formed to be spaced from each other.

[3] The semiconductor device according to claim 1,

20 wherein said second semiconductor region is formed in a belt shape.

[4] The semiconductor device according to claim 3,

wherein there are a plurality of said second semiconductor region, which are formed side by side with a space therebetween.

[5] The semiconductor device according to claim 1,

25 wherein an impurity concentration of said second semiconductor region is relatively high at a center part of said semiconductor base, and relatively low at a peripheral part thereof.

[6] The semiconductor device according to claim 1,

wherein said first electrode is formed on said second semiconductor region via an insulating film, and a film thickness of said insulating film is relatively thick at a center part of said semiconductor base, and relatively thin at a peripheral part thereof.

5 [7] A semiconductor device, comprising a semiconductor base including a first semiconductor region having a first conductivity type, a second semiconductor region having a second conductivity type formed in a surface region of said first semiconductor region, and a third semiconductor region having the first conductivity type formed in a surface region of said second semiconductor region,

10 wherein said third semiconductor region is formed along a first direction such that a rate at which it occupies said second semiconductor region is larger at a peripheral part of said semiconductor base than at a center part thereof, and formed along a second direction perpendicular to said first direction such that a rate at which said third semiconductor region occupies said second semiconductor region is larger at said peripheral part of said
15 semiconductor base than at said center part thereof.

[8] The semiconductor device according to claim 7,

wherein said second semiconductor region is formed in a belt shape, and said first direction is defined in parallel with an extending direction of said second semiconductor region.

20 [9] The semiconductor device according to claim 7,

wherein said second semiconductor region is formed in an island shape, and said first direction is defined in parallel with or perpendicularly to a part of edges of said semiconductor device.

[10] A semiconductor device, comprising:

25 a semiconductor base comprising a first semiconductor region having a first conductivity type, a second semiconductor region having a second conductivity type formed in a surface region of said first semiconductor region, and a third semiconductor

region having the first conductivity type formed in a surface region of said second semiconductor region;

an insulating film formed on said second semiconductor region sandwiched between said first semiconductor region and said third semiconductor region; and

5 a first electrode formed on said insulating film,

wherein said insulating film comprises a first region formed at a center region of said semiconductor base to have a first thickness, and a second region formed to have a second thickness thinner than said first region at a circumference of said semiconductor base so as to enclose said first region.

10 [11] A semiconductor device, comprising:

a semiconductor base comprising a first semiconductor region having a first conductivity type, a second semiconductor region having a second conductivity type formed in a surface region of said first semiconductor region, and a third semiconductor region having the first conductivity type formed in a surface region of said second

15 semiconductor region;

an insulating film formed on said second semiconductor region sandwiched between said first semiconductor region and said third semiconductor region; and

a first electrode formed on said insulating film,

20 wherein said second semiconductor region comprises a first region formed at a center of said semiconductor base to have a first impurity concentration, and a second region formed to have a second impurity concentration lower than said first impurity concentration at a circumference of said semiconductor base so as to enclose said first region.